FIG 1. Parasitic Budgeting Flow

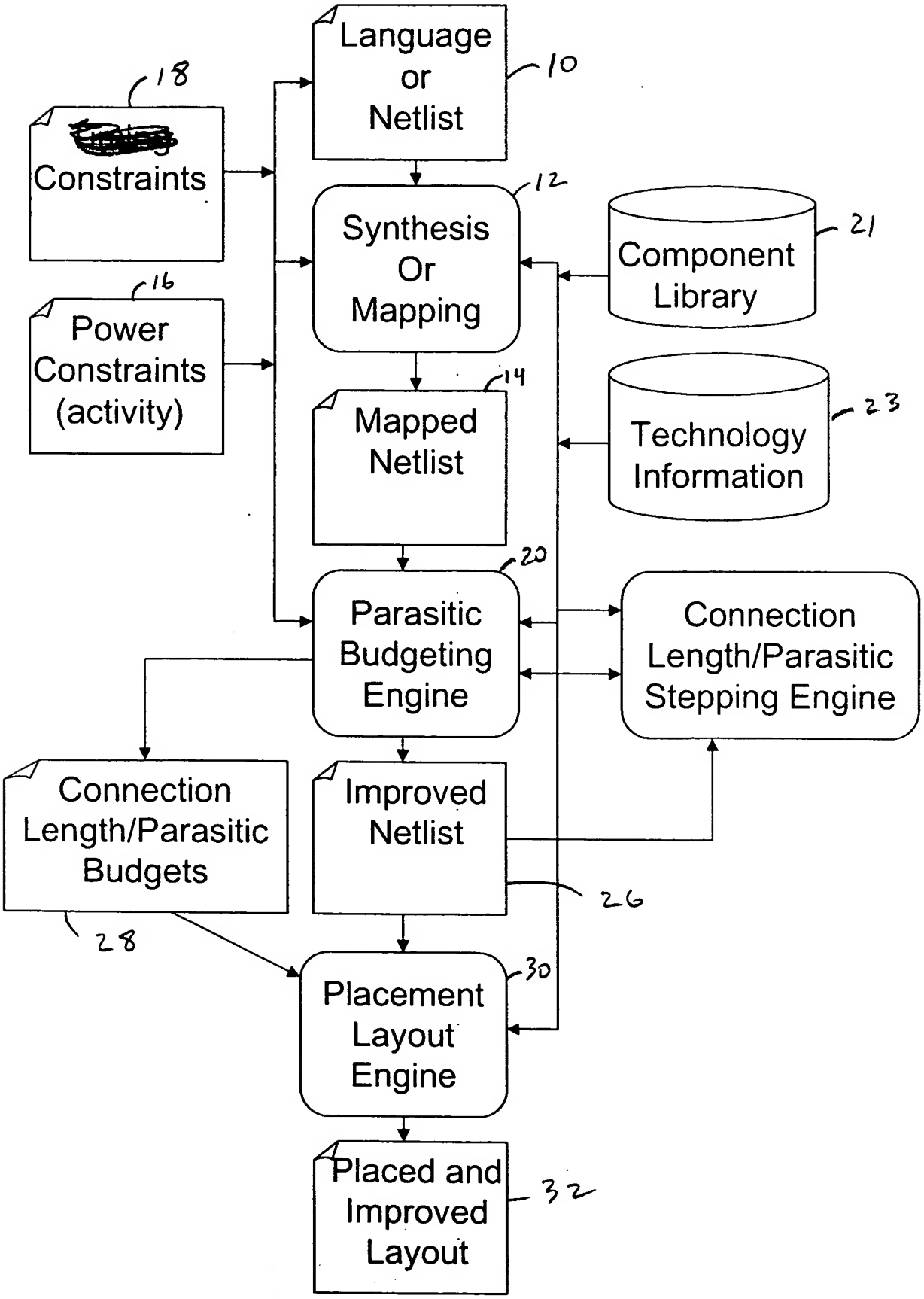

FIG 2a. Parasitic Budgeting Flow

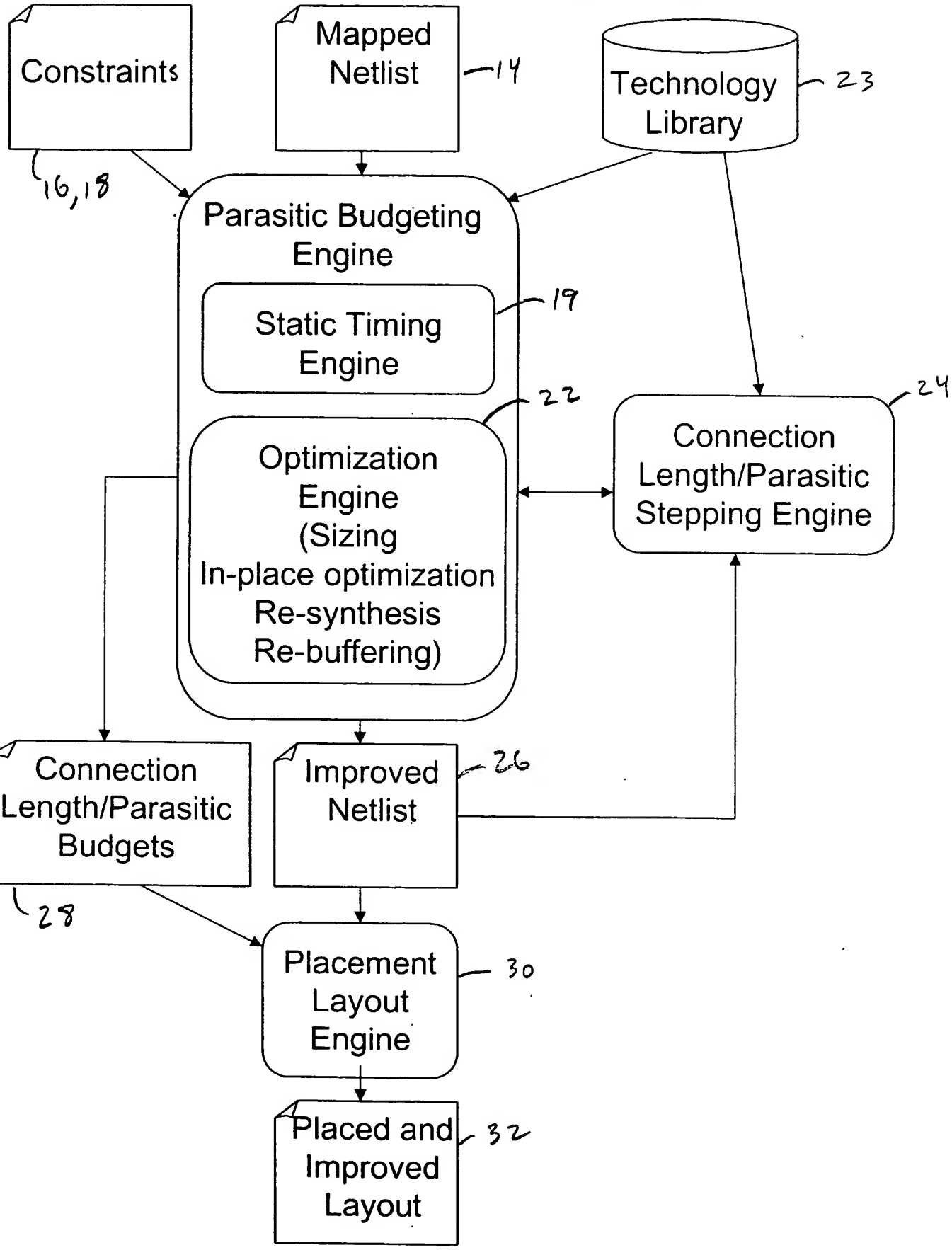

FIG. 2b: PROCESS FLOW FOR ONE ITERATION OF THE ITERATIVE PARASITIC BUDGET OPTIMIZATION PROCESS

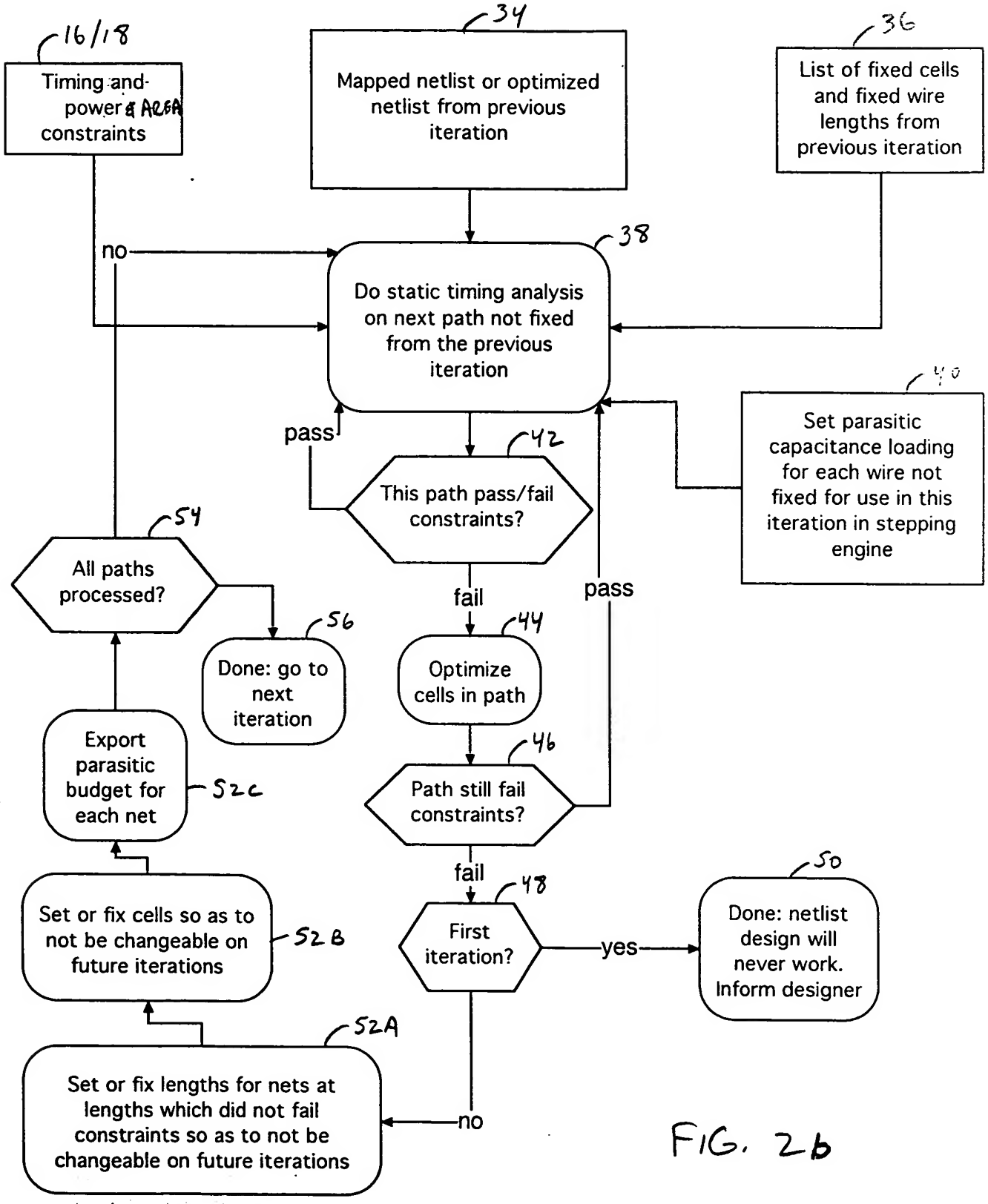

FIG. 2b

FIG 2c. Alternate Implementation flow for each path inside each parasitic level iteration.

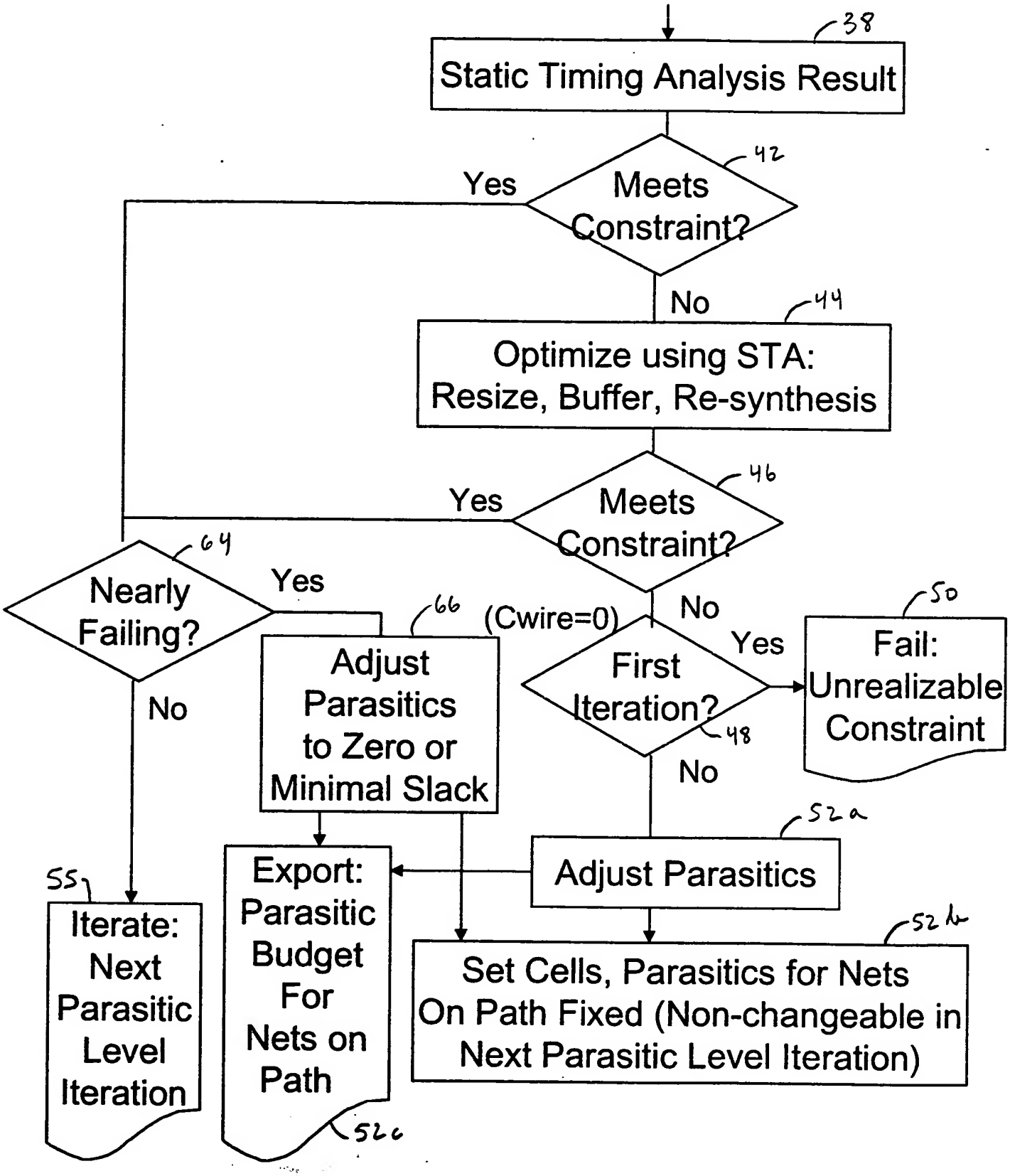

FIG 2d. Alternate Implementation flow power optimization of parasitic budget.

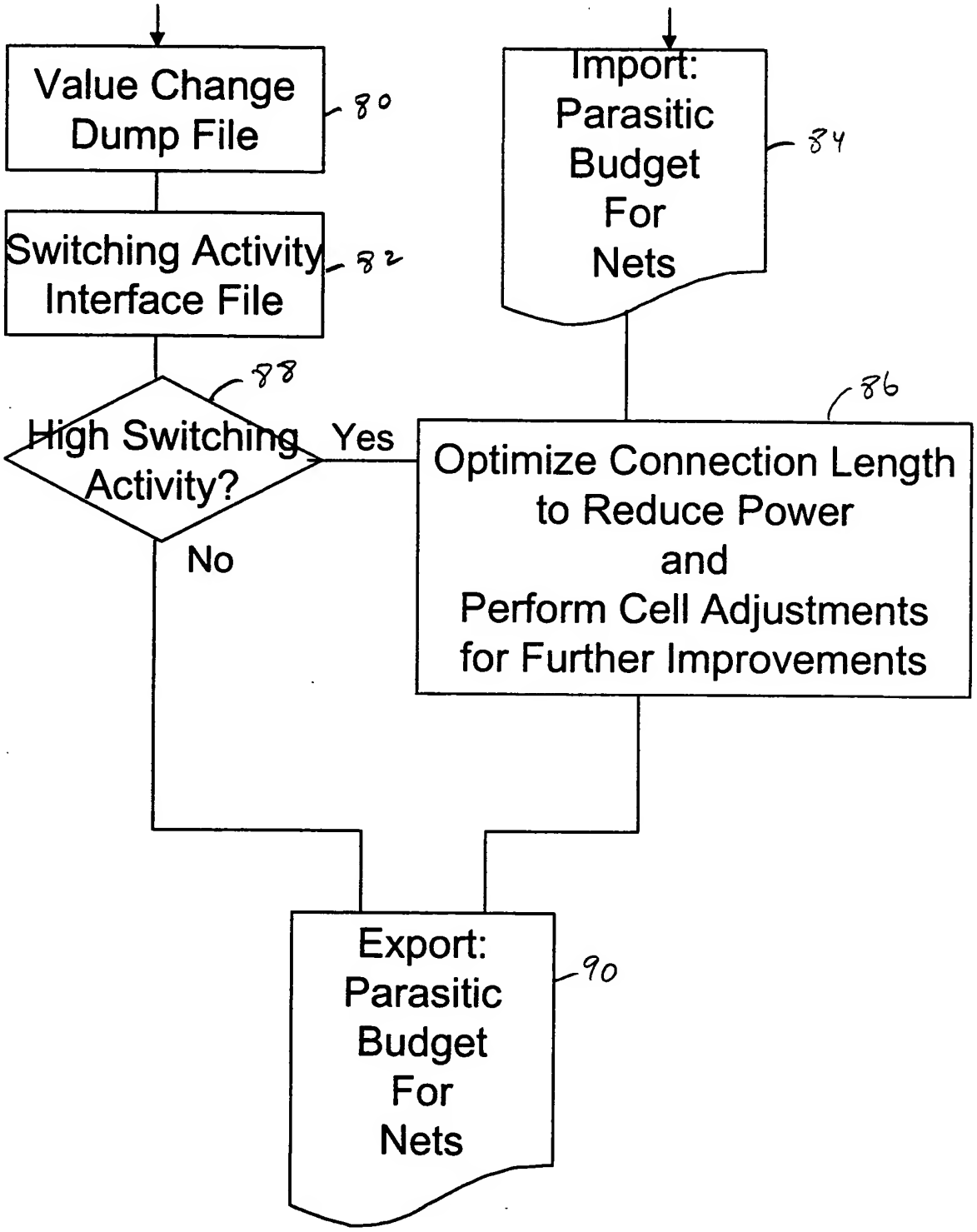

FIG 3. Critical Path Stage Element

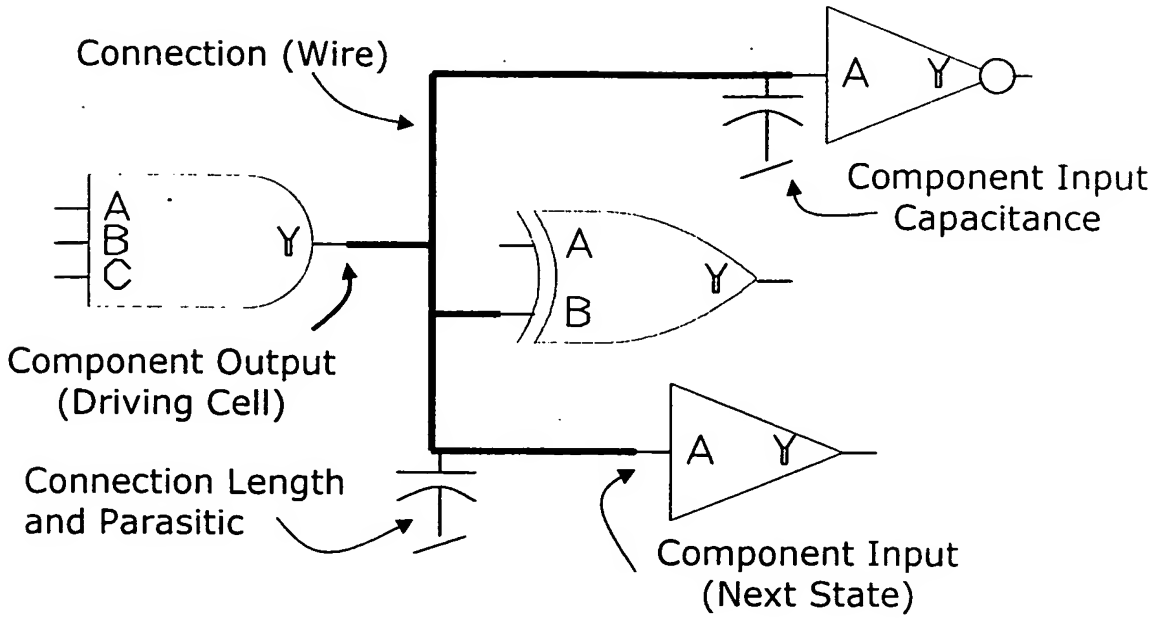

FIG 4
. Critical Path Register Structure

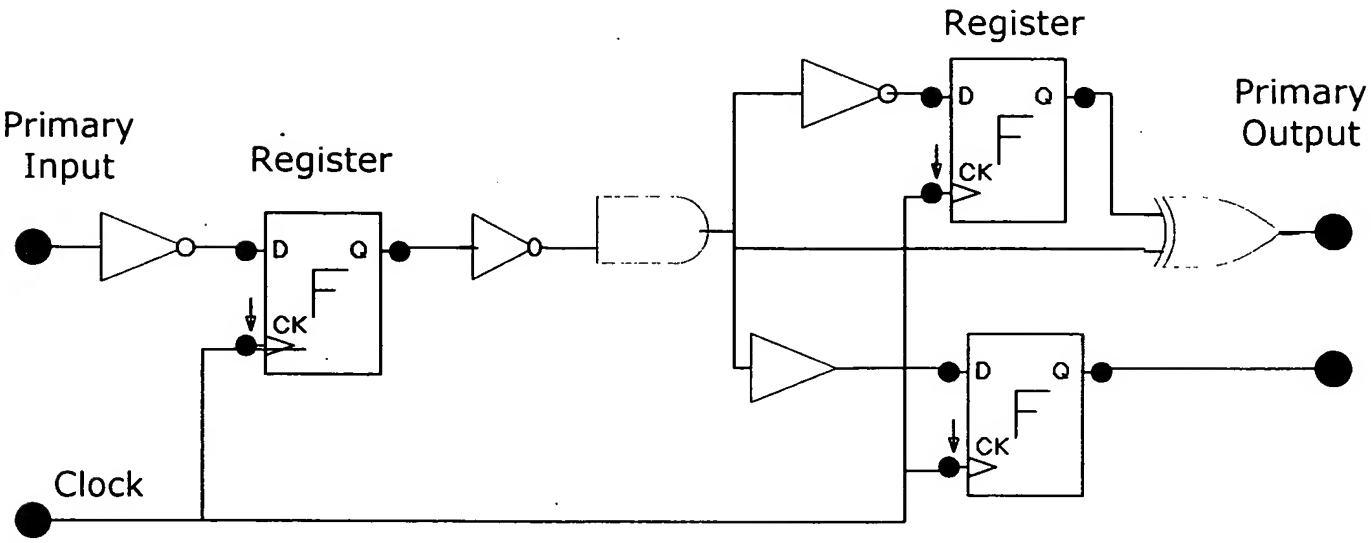

FIG 5

. Delay as Function of Fanout and Connection Length

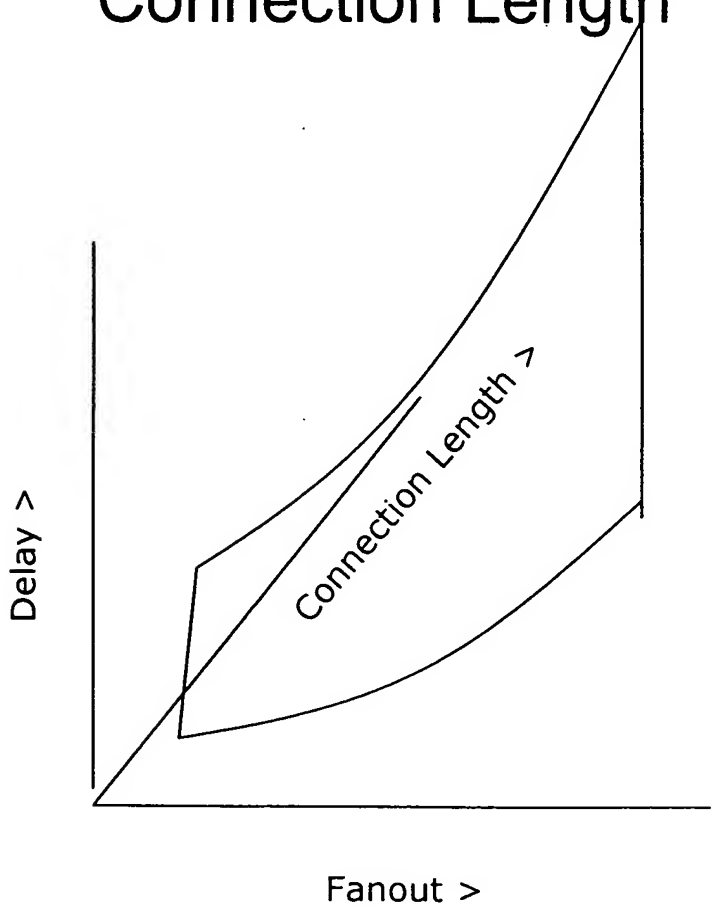

FIG 6a. Parasitic elements contributing to cell delay (NAND2 with Fanout=2)

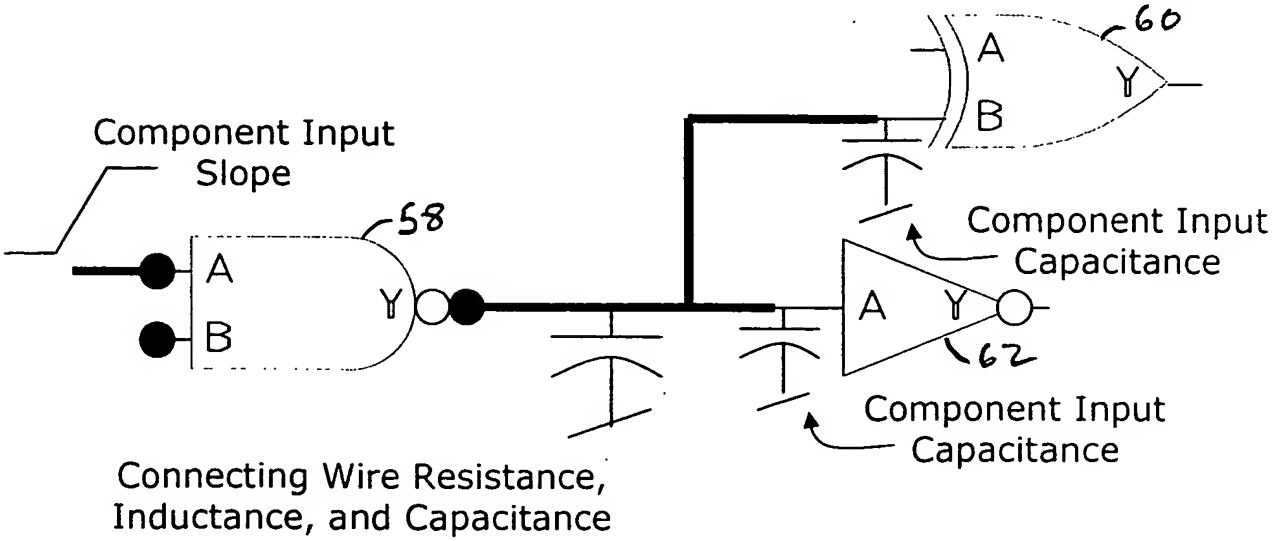

FIG 6b. Delay of a NAND2 component as a function of Cin multiples

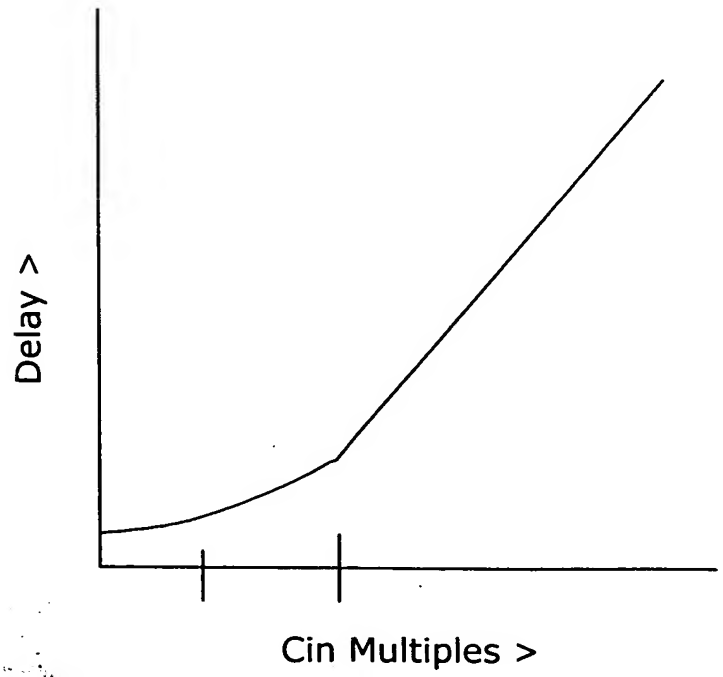

FIG 7. Connection length where Cwire matches Cin as function of process

Technology Node	Cin (pf)	Length (um)
	Average	Cwire=Cin
CMOS 90nm	0.0025	6.02
CMOS 0.13um	0.0052	23.99
CMOS 0.18um	0.0079	40.63
CMOS 0.25um	0.0154	104.84

FIG 8. Distribution of connection lengths by fanout in a typical circuit

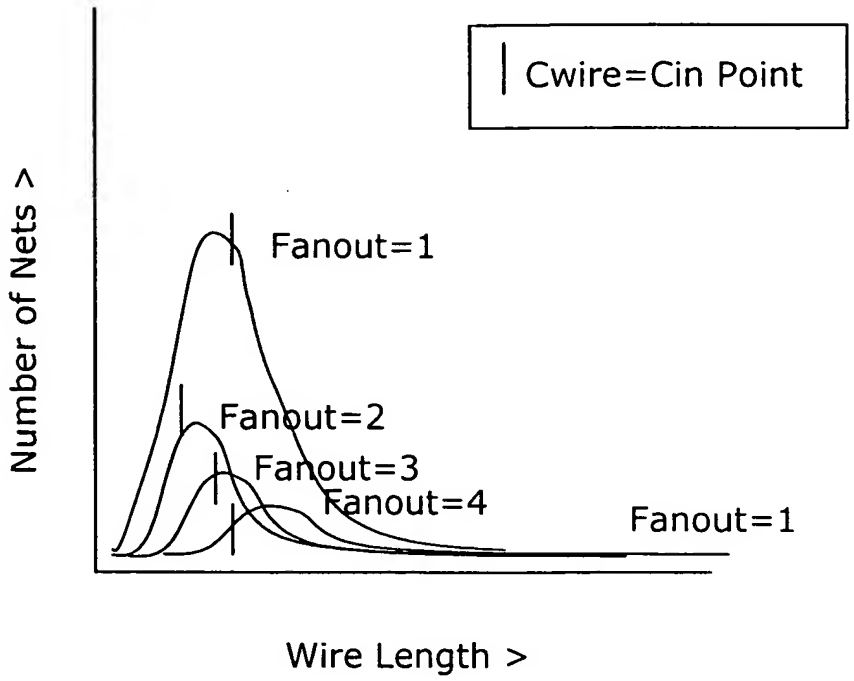

FIG 9. Symbolic representation of critical paths that can have different connection lengths and meet timing

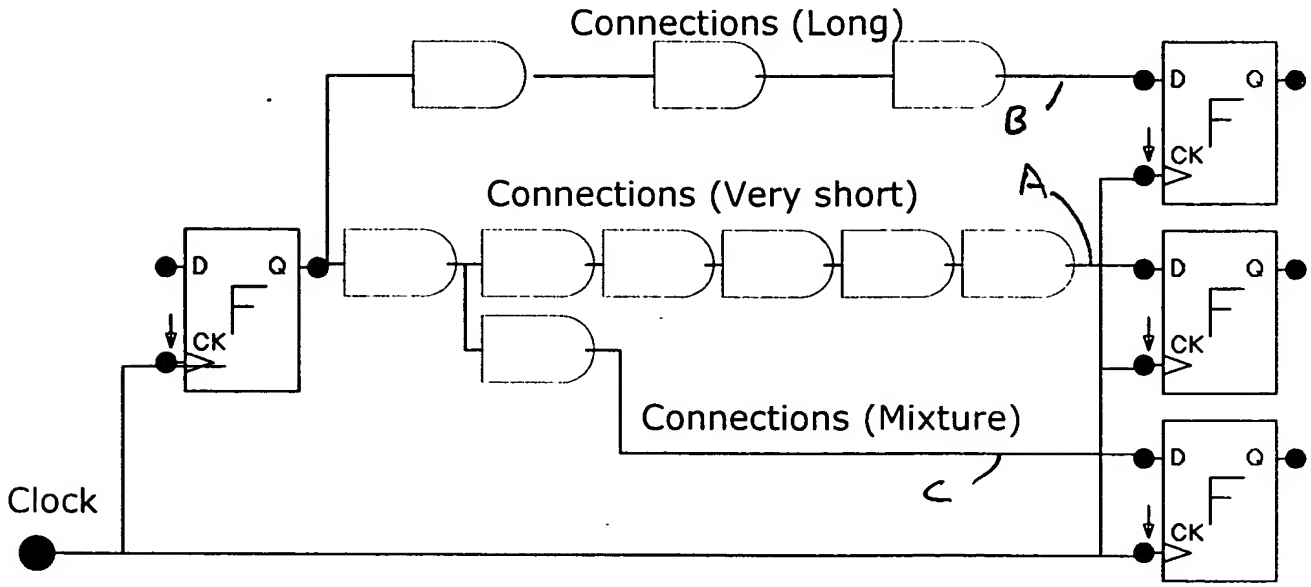

FIG 10. Typical Standard Cell row layout with short and long connections

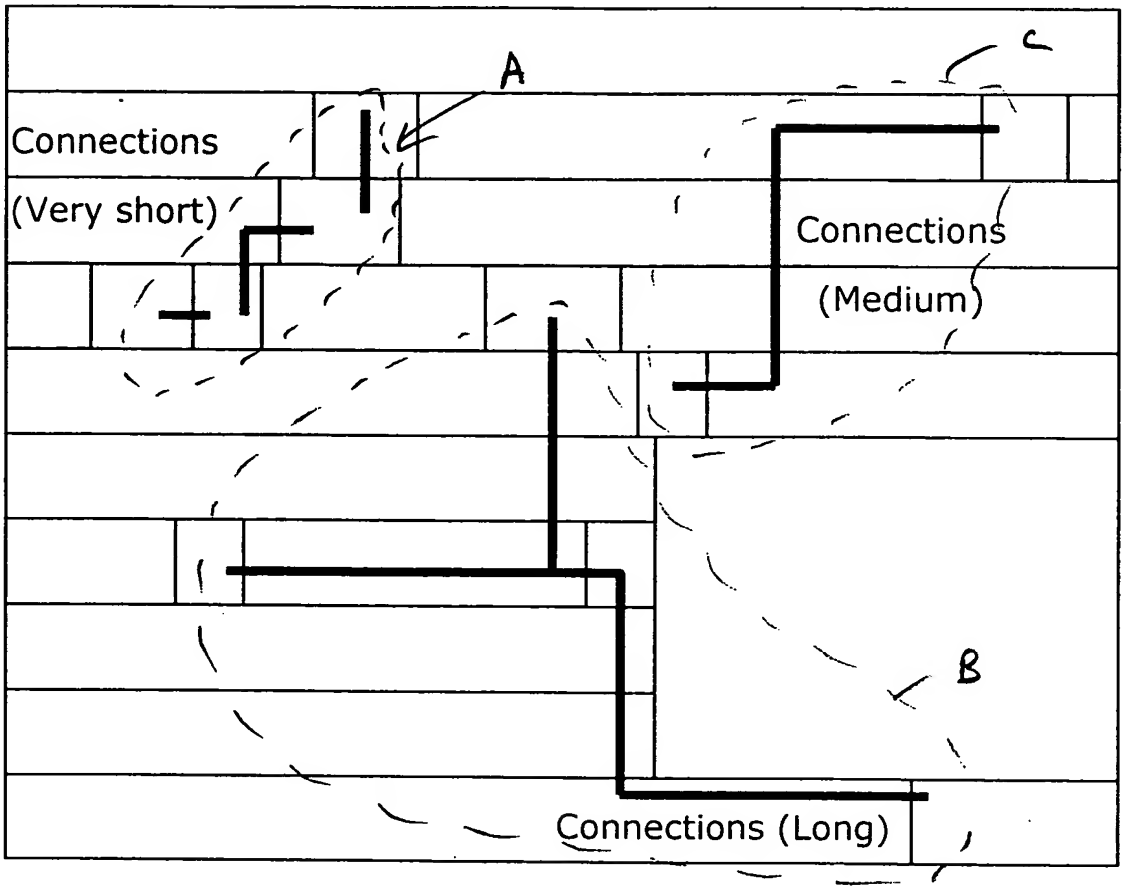

FIG 11. Typical Field Programmable Gate Array connections with special short and long connections

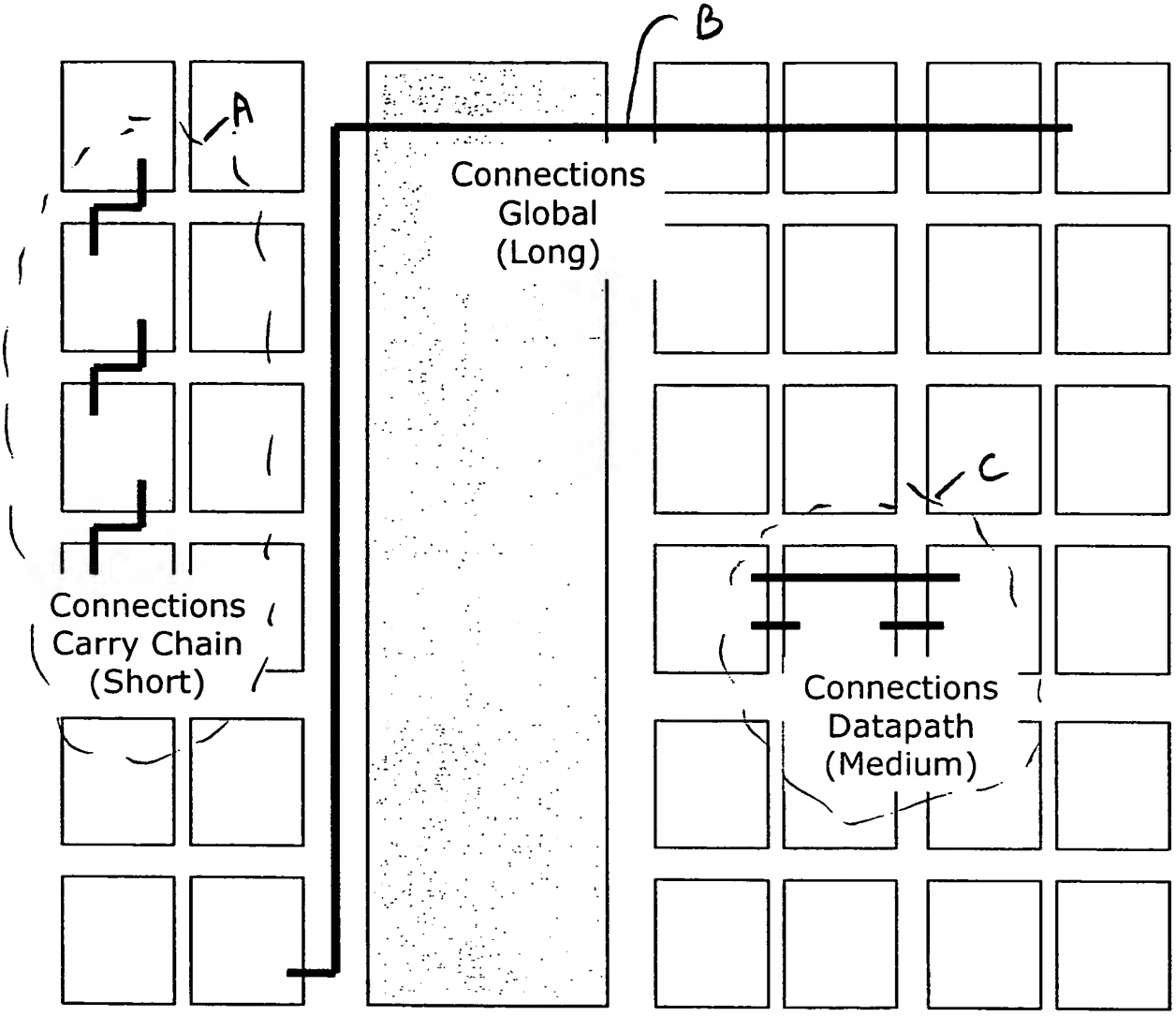

FIG 12. Connection length from a parasitic budget translation to weights for Placement and Partitioning

Connection Length (um)	Parsitic (Simple Cap)	Cin Multiple	Hierarchy Class	Physical Weight
2.00	0.0007	0.1	simple	90
6.00	0.0021	0.4	simple	80
14.00	0.0050	1.0	simple	72
24.00	0.0086	1.7	simple	44
56.00	0.0200	4.0	simple	22
56.00	0.0200	4.0	complex	10
148.00	0.0529	10.6	simple	16
467.00	0.1668	33.4	simple	8
800.00	0.2857	57.1	simple	4
800.00	0.2857	57.1	complex	2

FIG 13. Connection length clustering around a Placement or Partitioning cutline

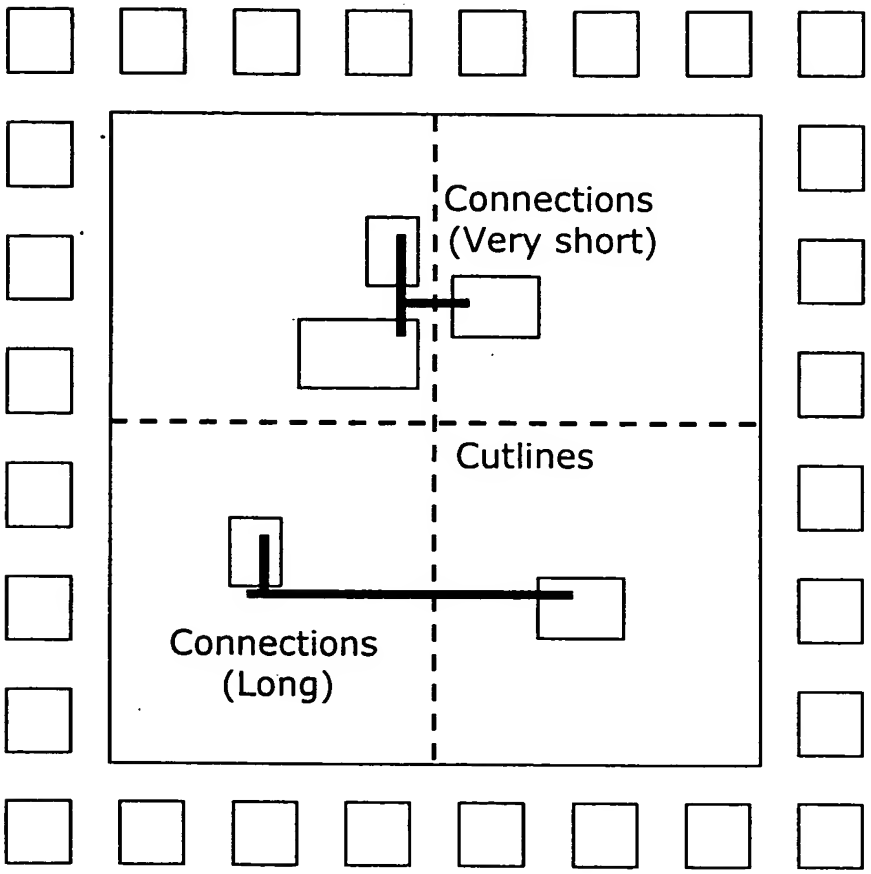

FIG 14. Placement clustering based on connection length from a parasitic budget